



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,948	07/11/2003	Teodor Dogaru	46872/276853	4478

44231 7590 09/09/2005

KILPATRICK STOCKTON LLP - 46872  
J. STEVEN GARDNER  
1001 WEST FOURTH STREET  
WINSTON-SALEM, NC 27101

EXAMINER

WHITTINGTON, KENNETH

ART UNIT PAPER NUMBER

2862

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/617,948

Applicant(s)

DOGARU, TEODOR

Examiner

Kenneth J. Whittington

Art Unit

2862

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) 2,6-31,37-39,47 and 48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,32,34-36,40-46,49 and 50 is/are rejected.
- 7) ☒ Claim(s) 33 and 51 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.



Bot Ledynh  
Primary Examiner

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election with traverse of Group II, claims 3-5, 32-36, 40-46 and 49-51, in the reply filed on July 13, 2005 is  
5 acknowledged. However, Applicant has not provided any arguments or reasons in support of the traversal. Accordingly, the requirement is still deemed proper and is therefore made FINAL.

It is also noted that since Claim 1 was indicated as being generic and claims 3-5 depend therefrom, it will be examined  
10 along with this Group.

### *Specification*

Applicant is reminded of the proper language and format for an abstract of the disclosure.  
15

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the  
20 abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent  
25 text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure  
30 concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because on line 1, it contains a phrase that can be implied, i.e., "The present invention is directed to". Correction is required. See MPEP § 608.01(b).

5

*Claim Objections*

Claims 43-46 are objected to because "the detector" and "the amplitude and phase detector" lack antecedent basis. It appears all of these claims should depend from 42, not 41. For purposes of examination, they will be interpreted as such. Appropriate correction is required.

Claim 51 objected to because of the following informalities: on line 1, "specimIn" should be "specimen". It appears that the listing of claims provided by Applicant had the correct spelling, but the paper had mark on it making the term scan incorrectly during processing in the PTO. Appropriate correction is requested in any subsequent amendments.

Claim 51 is also objected to because "the symmetry axis" is unclear whether it means the first or second symmetry axis. For purposes of examination, the claim will be interpreted as either

Art Unit: 2862

the first or second symmetry axis. Appropriate correction is required.

*Claim Rejections - 35 USC § 102*

5           The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

10           (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

          Claims 1, 3 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by van Andel et al. (US 6,291,992),  
15   hereinafter Andel. Regarding these claims, Andel discloses:

          a pair of excitation coils having a cross-section disposed within a common plane, the excitation coils having a first and second symmetry axes orthogonal to each other within the common plane, wherein the excitation coils create a magnetic field and  
20   eddy currents into an SUT (See Andel FIG. 4, coils 41 and 42), the coils interconnected such that when current is passed through the coils, each creates a magnetic field in the same direction (see FIG. 2 and col. 3, line 39 to col. 4, line 9, note that because of the direction of current A, the coils would  
25   create a magnetic circuit that travels through each coil and

Art Unit: 2862

through the conductive material there between. Since each coil contributes to the circuit, each would create the magnetic field in the same direction along the circuit); and

at least one magnetic sensor operable to be positioned on one symmetry axis, or at the intersection of the two symmetry axes, of the excitation coils and having a sensitive axis operable to be disposed within the common plane perpendicular to the symmetry axis of the excitation coils (See FIG. 4, item 46).

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

Art Unit: 2862

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5

Claims 4, 32, 34 and 35 and are rejected under 35 U.S.C.

103(a) as being unpatentable over Andel in view of McMaster et al. (US 3,359,495), hereinafter McMaster. Andel teaches all the features as discussed above with respect to claims 1, 3 and 5 as  
10 noted above. Andel further teaches the pair of coils creating a magnetic field and eddy currents in opposite directions (note that where the magnetic circuit enters and exits the conductive layers, the magnetic field will be traveling in opposite directions and accordingly creating oppositely moving eddy  
15 currents). However, Andel does not teach using a rectangular coil in lieu of a round coil. McMaster teaches using a rectangular coil for the exciting coil in an eddy current probe (See McMaster FIG. 11). It would have been obvious at the time the invention was made to use a rectangular coil in the  
20 apparatus of Andel. One having ordinary skill in the art would have been motivated to do so to determine the polarization effects of the conductive material (See McMaster col. 11, lines 19-43).

Regarding claims 34 and 35, the noted combination teaches the excitation coils have at least one or a plurality of layers (See Andel col. 3, lines 61-65 and FIG. 4, items 11 and 12).

5        Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andel in view of McMaster as applied to claim 32 above, and further in view of Cotter (US 20040000904A1). The noted combination teaches the features except the use of a ribbon cable for the coil. Cotter teaches using a ribbon cable  
10 to form an exciting coil for a eddy current metal detector wherein the coil comprises a ribbon cable with a plurality of insulated wires, a pair of connectors to the cable and jumpers connecting the individual wires to form the coil (See Cotter FIG. 2, note ribbon cable and connections, see also paragraphs  
15 0062-0066). It would have been obvious at the time the invention was made to incorporate the ribbon cable coil of Cotter into the apparatus of the noted combination. One having ordinary skill in the art would have been motivated to do so to create a compact and evenly spaced coil assembly.

20

Claims 40, 41, 43-46 and 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andel in view of



Art Unit: 2862

McMaster as applied to claim 32 above, and further in view of Wincheski et al. (US 6,888,346), hereinafter Wincheski.

Regarding claims 40, 41 and 49, Andel in view of McMaster teaches the features noted above, but does not teach the use of Hall or magnetoresistive sensors. Wincheski teaches using Hall or magnetoresistive sensors in non-destructive eddy current sensors (See Wincheski col. 1, line 21 to col. 2, line 42). It would have been obvious to use either Hall or magnetoresistive sensors in lieu of the coil in the apparatus of Andel in view of McMaster. One having ordinary skill in the art would have been motivated to do so because, as recognized by Wincheski at the noted portion, such sensors or coils are well known alternatives to measuring the magnetic field induced in the conductive body in eddy current testing apparatus.

Regarding claims 42-46, Andel in view of McMaster teaches the features of claim 32 and further applying an alternating current to the coils (See Andel col. 4, line 65 to col. 5, line 56). However, this combination does not explicitly teach the remaining features of these claims. Wincheski teaches an amplifier connected to the sensor and an amplitude and phase detector connected to the amplifier, which can operate as a lock-in amplifier used to record data (See FIGS. 4, 5A and 5B, items 185 and 180, and col. 7, line 29 to col. 13, line 6), a

Art Unit: 2862

display in communication with the results (See col. 8, line 23 to col. 13, line 6, note that the results recorded are displayed for observation in some means). It would have been obvious at the time the invention was made to incorporate such devices into the noted combination. One having ordinary skill in the art would have been motivated to do so to increase the signal from the sensor and prepare the signal for display to determine location and perform analysis of cracks (See same portion). Furthermore, the portion cited refers to processing and data analysis on the signal into an image, which requires some sort of program code to operate.

Regarding claim 50, the noted combination teaches the plane of the excitation coils being coplanar with the top surface of the SUT (See Andel FIGS. 2 and 4 and col. 5, lines 54-56).

#### ***Allowable Subject Matter***

Claims 33 and 51 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 33, the prior art does not show the rectangular coils intersecting with one another, in combination with the other features of the claim.

Regarding claim 51, the prior art does not show or teach scanning the top surface of the SUT along the symmetry axis of the fastener holes such that the first symmetry axis of the excitation coils coincides with the symmetry axis of the fastener holes, in combination with the other feature of the claim.

10

#### ***Prior Art***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited prior art discloses various designs for and methods using eddy current sensors.

15

#### ***Conclusion***

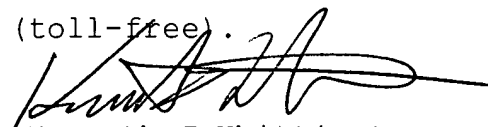
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

20

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is  
5 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status  
10 information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

15

  
Kenneth J Whittington  
Examiner  
Art Unit 2862

kjw